HOMEROOM PROFILE

Suggested Grade

6

SD Mathematics Strand & Standard *(Primary for the Task)*

Statistics & Probability

6.S.1.2. Students are able to display data using bar and line graphs and draw conclusions from data displayed in a graph.

Task Summary

Students will survey their homeroom class, organize the data, and then explain which graph best represents the data collected.

Time and Context of Task

This activity takes two to three class periods, depending on the availability of computers.

Materials Needed

Directions worksheet, drawing paper for graphs, laptops or other computers that have Microsoft Office (or other spreadsheet application software) and are connected to a color printer

Author and Lead Teacher for This Task

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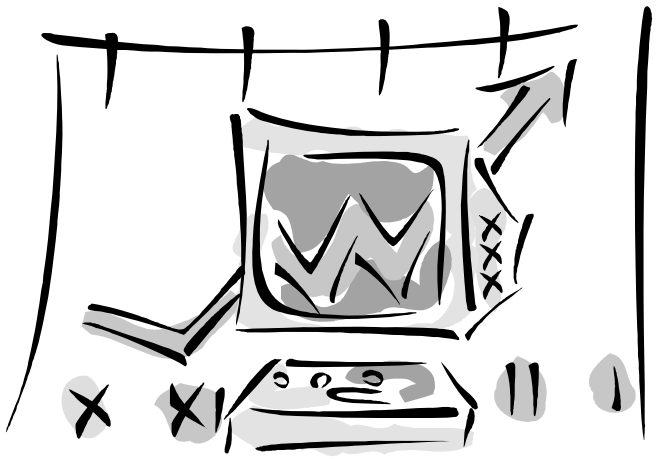
HOMEROOM PROFILE

Collecting, Organizing, and Graphing Data

Students will survey their homeroom class, organize the data and complete two bar graphs – one done by hand and the other done on the computer using Microsoft Excel (or any spreadsheet application). They will then write about any conclusions they can draw from their graph. They will also decide which of their graphs better represents the data and explain why.



"Homeroom Profile" – Collecting, Organizing, and Graphing Data

Directions: You will survey your homeroom on a specific topic. You will organize that data and complete two bar graphs – one done by hand and the other done on the computer using Microsoft Excel.

Step 1: Write your survey question and possible responses below. Have your teacher approve it and then survey every student in your homeroom. Use tally marks to record student responses.

Step 2: Organize your information onto the table below. Be sure to check your spelling. You may choose to eliminate any possible responses that were not chosen by students.

Response	Frequency

Step 3: Plan your bar graph. You want to fill the entire piece of paper with the graph, but remember to leave some room at the top for the title. You might also want to leave an inch border on all sides of the graph. Decide which is larger – the number of responses or the largest number of students for a single response. Put that item across the long side of the page. Be sure to evenly space responses and frequency across the paper. Bars should be the same width. Do a "sloppy copy" on your own paper to check placement on the graph.

Step 4: After getting your teacher's approval, do a final copy on the paper provided. Be sure to use a ruler to draw straight lines. Color each bar a solid color. Be sure to write and color neatly. Your title should include your homeroom and the topic of your survey. The x and y axes should be labeled. Your name, class period, and date should also be on the graph.

Step 5: Now you can use a program on the computer to make your second graph. Get a laptop and open up Microsoft Excel. Enter your responses and frequency into a spreadsheet. (Be sure to check your spelling and numbers.) Highlight what you've typed and click on the "Chart" icon. Follow the prompts to complete your graph. Choose a bar graph and column for the series. In step 3, be sure to put in your title, and categories for the x and y axes. Also, go to legend and deselect "show legend". In the last step, choose to save the chart as a new sheet.

Now that you have your chart, work on making it attractive and accurate. You may add color to the bars, title, labels, etc. You might also want to adjust the size and shape of the actual graph. When you're satisfied with your graph, show your teacher your finished graph before your print.

Step 6: Get a 12" x 18" piece of construction paper and glue both your graphs on it. Then hang it up in the hall.

Step 6: On lined paper you will write two paragraphs. In the first paragraph, list any conclusions you can draw from looking at your graph. In the second paragraph, tell which of your two graphs better represents the data and why.

CONTENT STANDARDS

Primary Standard

Strand Name: Statistics & Probability

SD Goal: Students will apply statistical methods to analyze data and explore probability for making decisions and predictions.

Indicator: Use statistical models to gather, analyze, and display data to draw conclusions.

Standard: 6.S.1.2. Students are able to display data using bar and line graphs and draw conclusions from data displayed in a graph.

NCTM Process Standard

Representations: Use representations to model and interpret physical, social, and mathematical phenomena.

Problem-Solving Strategies

- Drawing pictures, graphs, and tables
- Collecting and organizing data

ASSESSMENT TOOLS

Task Rubric

	Advanced	Proficient	Basic	Below Basic
Content Standard: 6.S.1.2. (1st part) Students are able to display data using bar and line graphs …	Graphs are accurate, neat, well-organized, and correctly labeled with few or no spelling or capitalization errors. Hand drawn graph is correctly scaled and appropriately uses available space. Color is used to enhance the presentation of the data.	Graphs are accurate, fairly neat, and correctly labeled. There are some spelling or capitalization errors. Hand drawn graph is correctly scaled. Color is used	Graphs are accurate, but one or more labels is missing and/or there are several spelling or capitalization errors. Frequency scale and bars are not evenly spaced. Graph is colored.	Graphs show little or no effort. They contain numerous spelling or capitalization errors. Hand drawn graph is incorrectly scaled. Color is missing or interferes with the presentation of data.
Content Standard: 6.S.1.2. (2nd part) **…** and draw conclusions from data displayed in a graph.	Several conclusions are drawn and include comparisons between two or more responses. The graph comparison focuses on the presentation of the data.	More than one conclusion is drawn from the graph. The graphs are compared and two or more reasons are given.	More than one conclusion is drawn from the graph. The graphs are compared and one reason is given.	Only one conclusion is drawn from the graphs. The graphs are not compared.

Sixth Grade Statistics & Probability
Performance Descriptors

Advanced	**Sixth grade students performing at the advanced level:** • represent data in bar and line graphs and draw conclusions from those graphs; • make predictions from a given graph; • find measures of central tendency from a set of data; • find the probability of a simple event.
Proficient	**Sixth grade students performing at the proficient level:** • represent data in bar and line graphs and draw conclusions from a given graph; • find mean, mode, and range of an ordered set of data; • find the probability of a simple event given pictorial representation.
Basic	**Sixth grade students performing at the basic level:** • draw bar and line graphs given appropriate scales; • find mode and range of an ordered set of data; • find the possible outcomes of a simple event given pictorial representation.

Sixth Grade Statistics & Probability
ELL Performance Descriptors

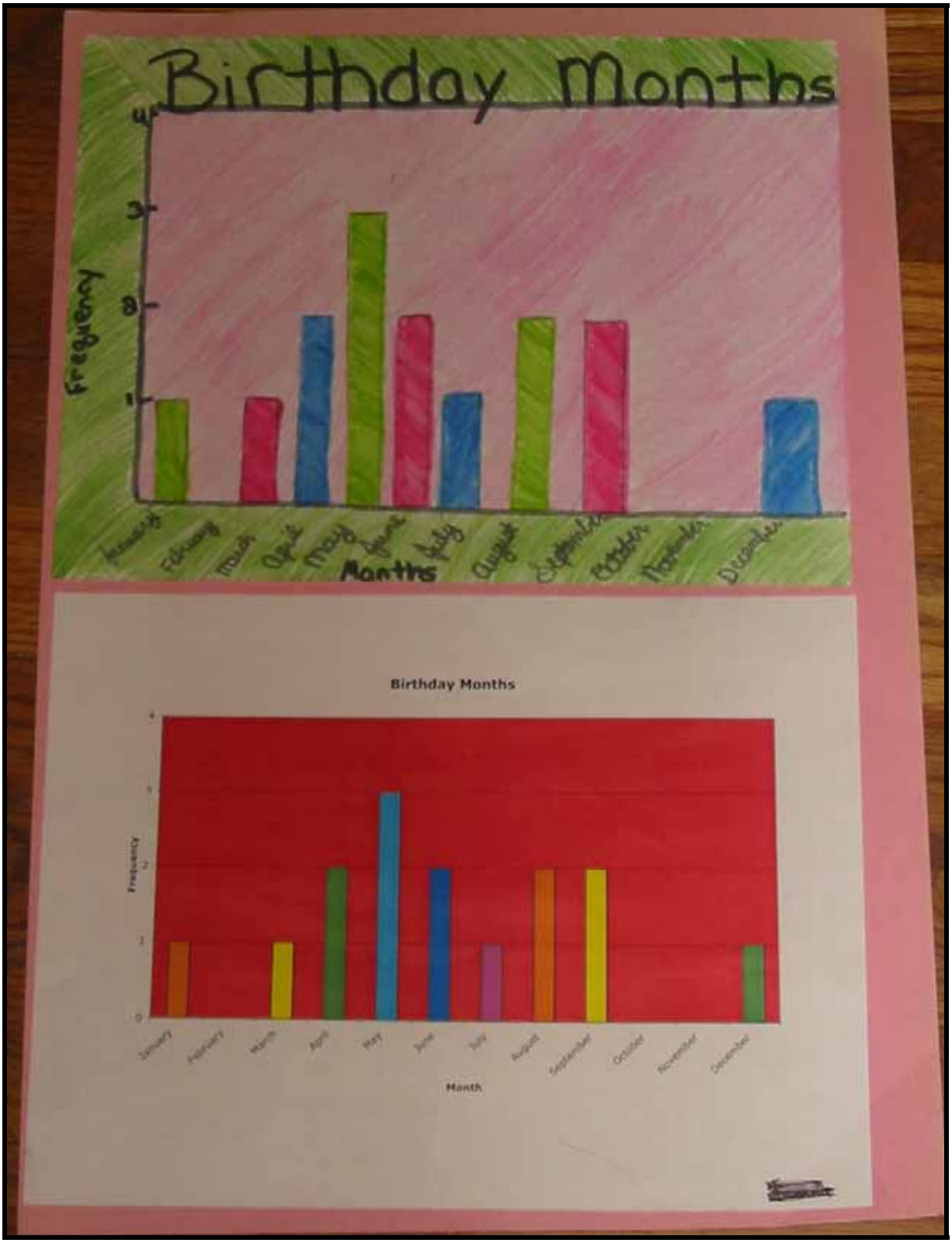
Proficient	**Sixth grade ELL students performing at the proficient level:** • represent data in line and bar graphs; • find mean, mode, and range from an ordered data set; • find the probability of simple events given pictorial representations; • read, write, and speak the basic language of statistics and probability.
Intermediate	**Sixth grade ELL students performing at the intermediate level:** • draw line and bar graphs given the scales; • find mode and range from an ordered data set; • find possible outcomes of simple events given pictorial representations; • read and answer directed questions about data in basic graphs; • explain in mathematical terms the sequence of steps used in solving problems; • give simple oral or written responses to directed questions on topics presented in class.
Basic	**Sixth grade ELL students performing at the basic level:** • find probability of simple events using concrete materials; • recognize and use basic statistical and probability terms; • respond to yes or no questions and to problems presented pictorially or numerically in class.
Emergent	**Sixth grade ELL students performing at the emergent level:** • copy and write statistics and probability symbols and figures; • imitate pronunciation of statistical and probability terms; • use non-verbal communication to express mathematical ideas.
Pre-emergent	**Sixth grade ELL students performing at the pre-emergent level:** • observe and model appropriate cultural and learning behaviors from peers and adults; • listen to and observe comprehensible instruction and communicate understanding non-verbally.

HOMEROOM PROFILE
Student Work Samples

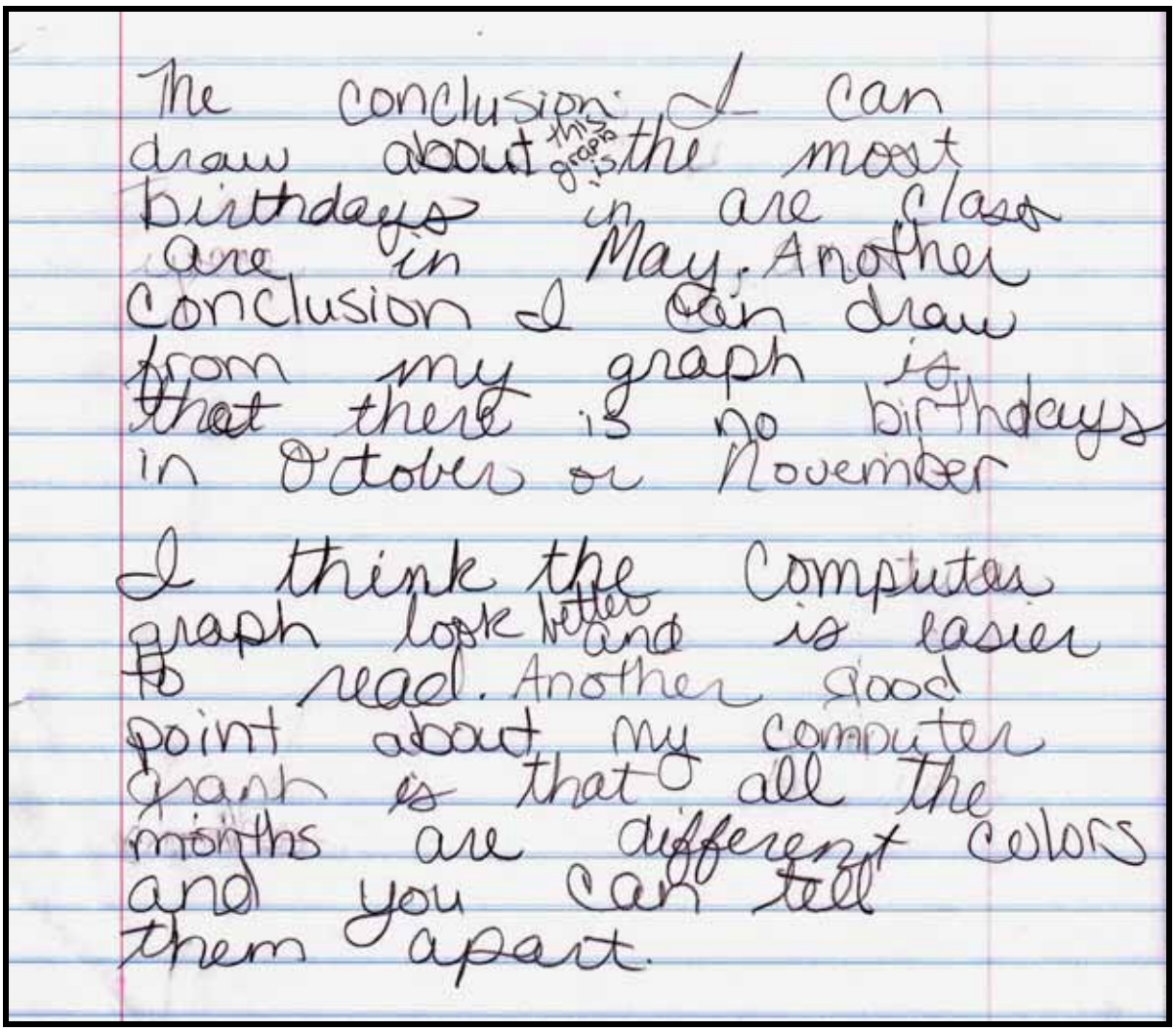
As you examine the samples, consider the following questions:

- In light of the standard/s addressed and the assessment tools provided, what evidence does the work provide that students are achieving proficiency in the knowledge and skills addressed by the standard/s for the task?
- Is the task/activity well designed to help students acquire knowledge and demonstrate proficiency? Is the task/activity clearly aligned with the standards? In what ways would you adapt the task/activity to better meet the needs of your students?

Student Work Sample #1



Sample #1 – page 2

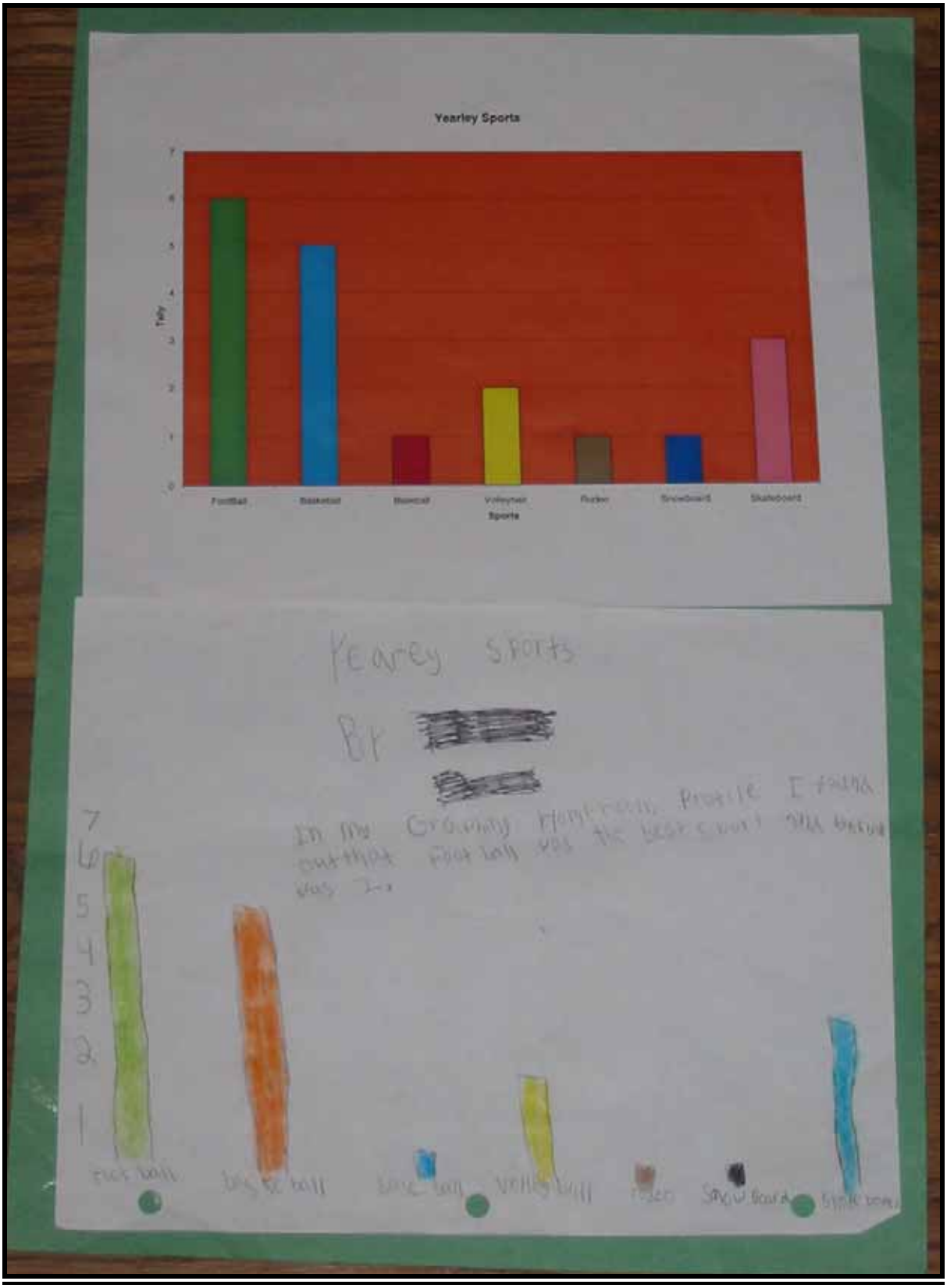

The conclusion I can draw about this graph is the most birthdays in are class are in May. Another conclusion I can draw from my graph is that there is no birthdays in October or November

I think the Computer graph look better and is easier to read. Another good point about my computer graph is that all the months are different colors and you can tell them apart.

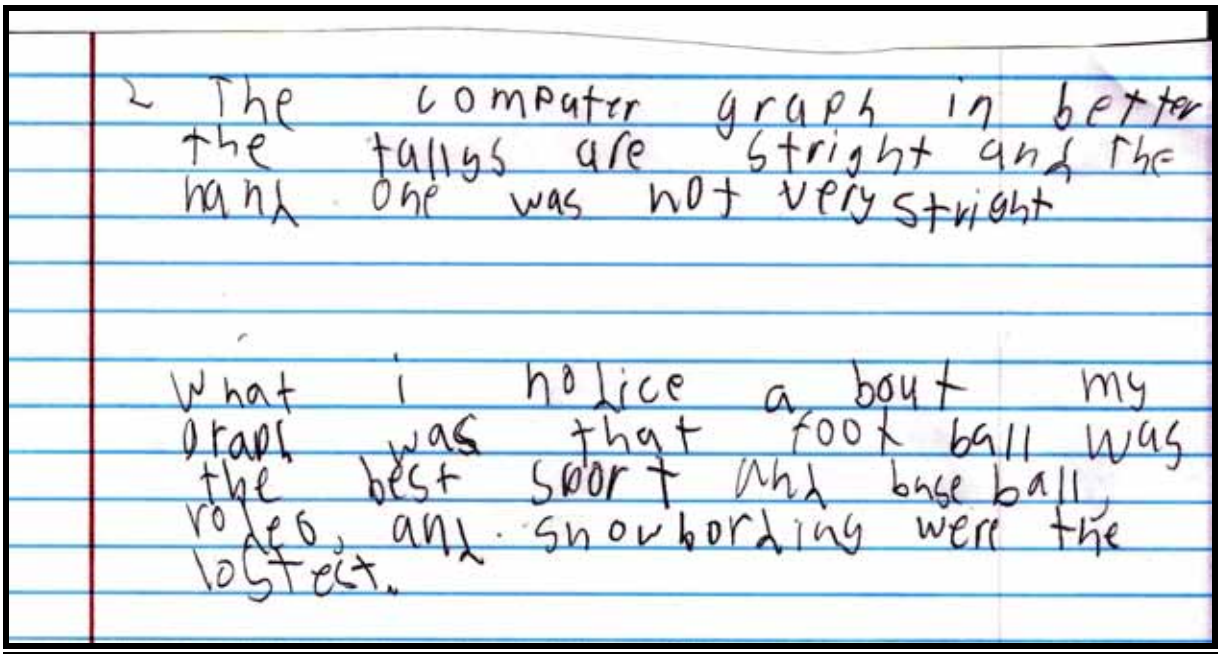
Looking at Student Work – Instructor notes and rating for work sample #1:

Both of her graphs have all items labeled and all words capitalized and spelled correctly. On the hand-drawn graph, the frequencies and bars are evenly spaced, though the December bar is wider than the others. When drawing conclusions, she identifies the most and least common answers. She gives two reasons why her computer graph is better. She received a score of "advanced" on the first half of Content Standard 6.S.1.2 and a score of "proficient" on the second half.

Student Work Sample #2



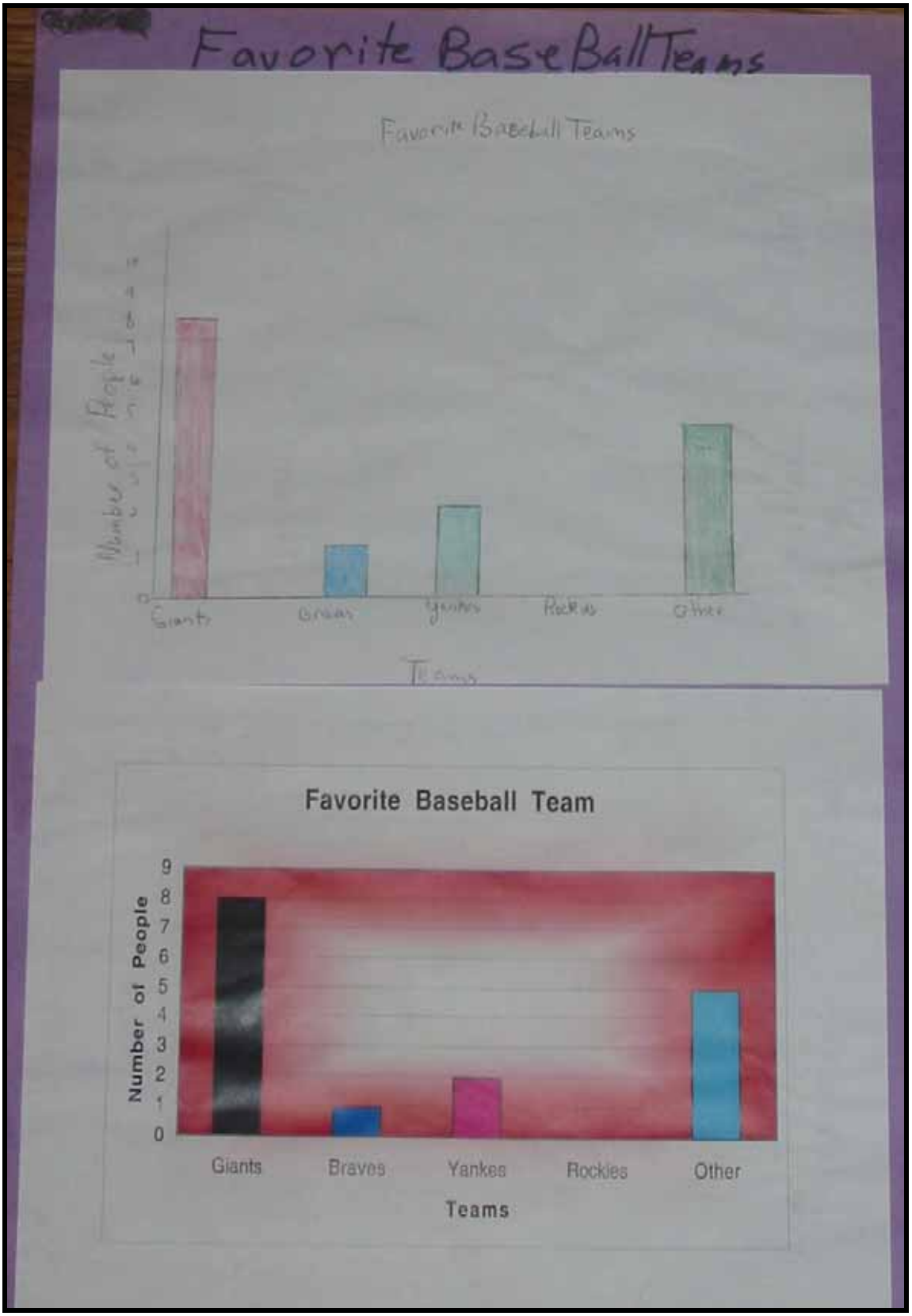
Sample #2 – page 2



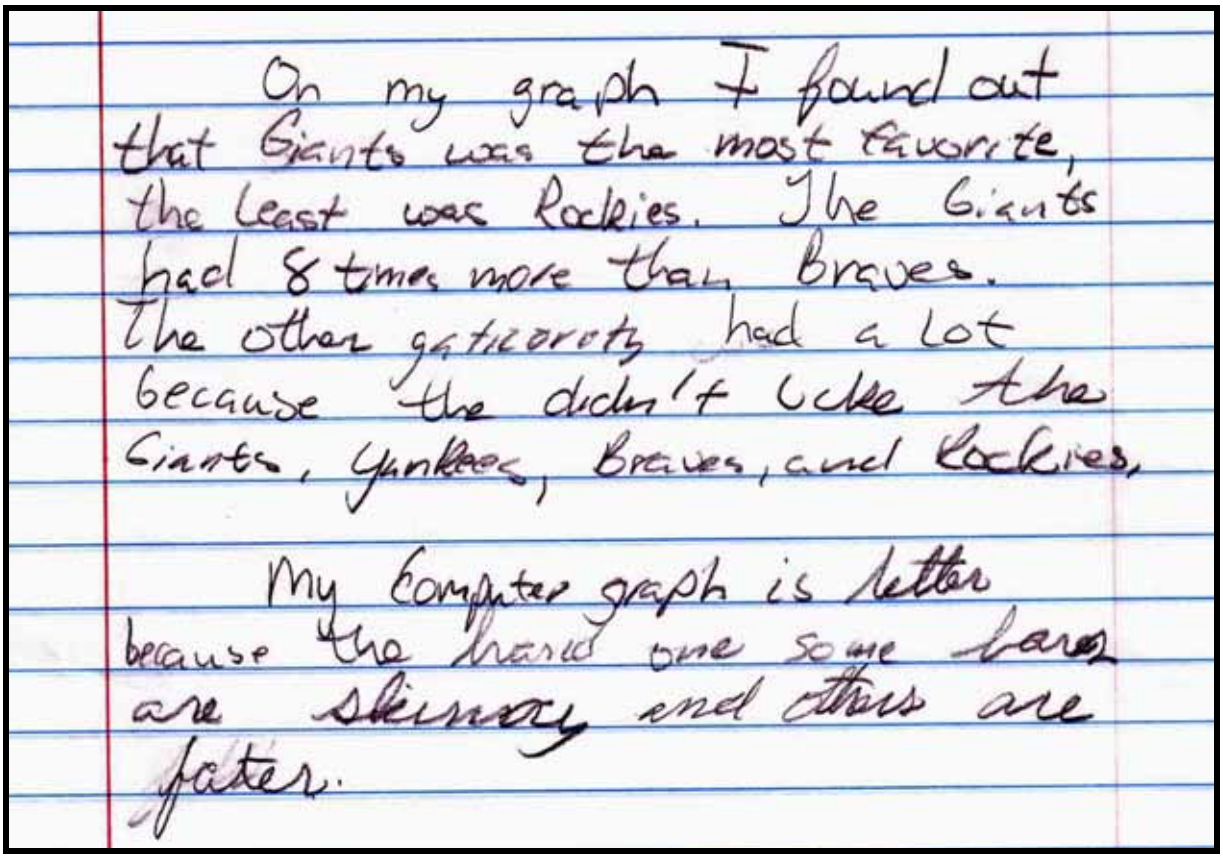
Looking at Student Work – Instructor notes and rating for work sample #2:

He did not draw the x and y axes nor write titles for them on his hand-drawn graph. His frequency is not evenly spaced, zero is missing, and no marks are made to show where the numbers are. He did space the bars evenly, but they're very narrow. He has several capitalization errors. On the computer graph, he has one spelling and one capitalization error; otherwise the graph has all needed items. He identifies the most and least common answers and gives one reason why the computer graph is better. He received a score of "basic" on the first half of Content Standard 6.S.1.2 and a score of "basic" on the second half.

Student Work Sample #3



Sample #3 – page 2



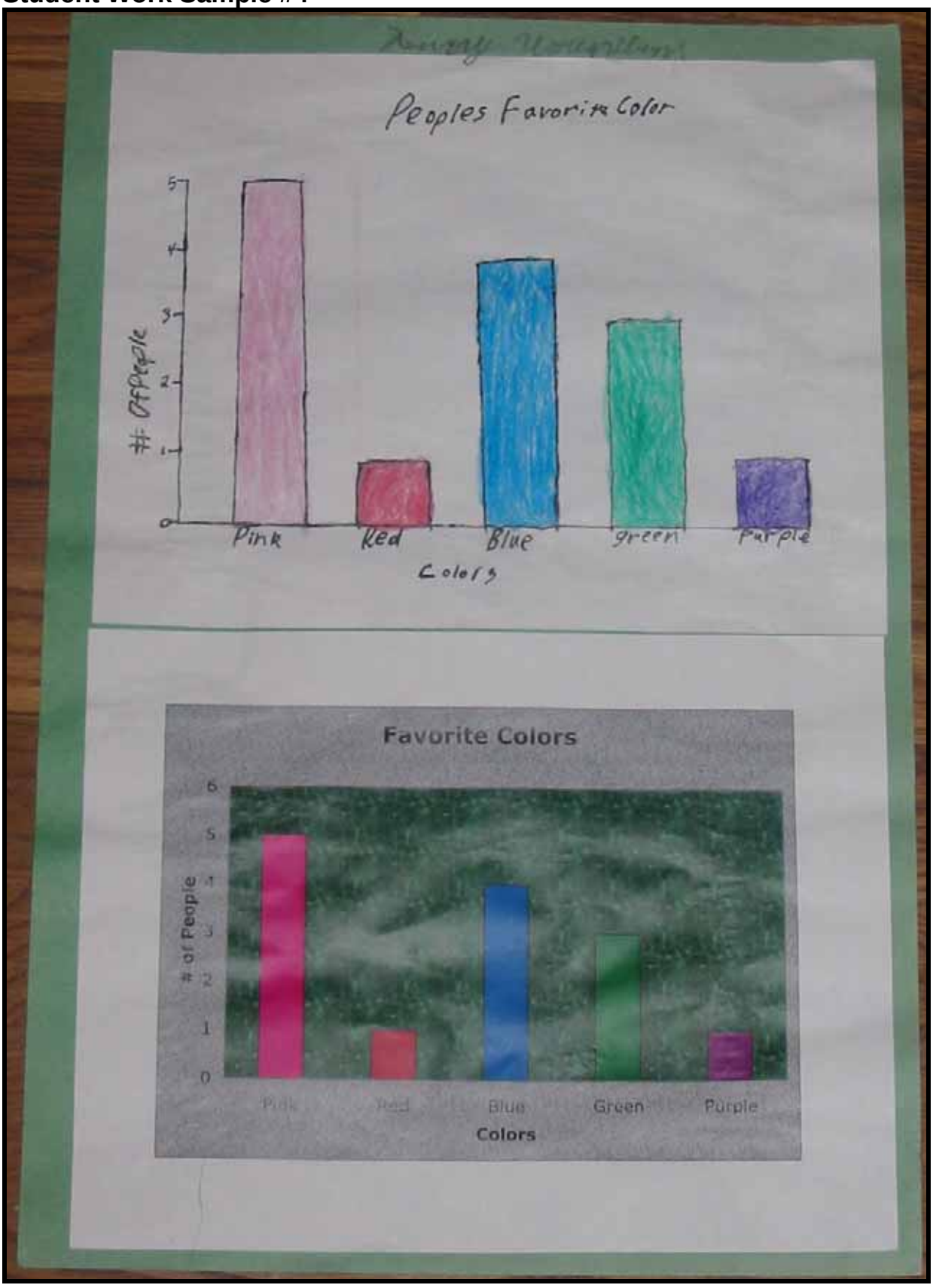
On my graph I found out that Giants was the most favorite, the least was Rockies. The Giants had 8 times more than Braves. The other gatecoroty had a lot because the didn't like the Giants, Yankees, Braves, and Rockies.

My Computer graph is better because the hand one some bars are skinny and others are fater.

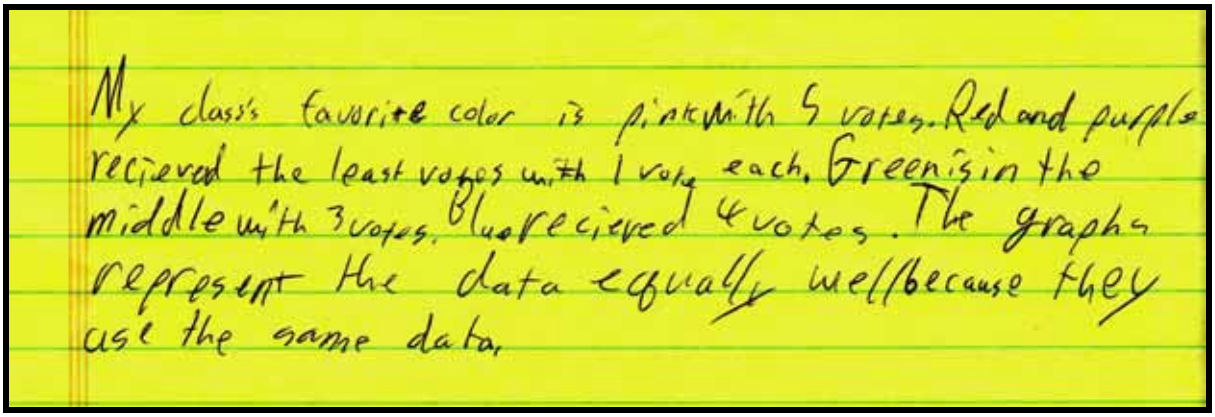
Looking at Student Work – Instructor notes and rating for work sample #3:

Both of his graphs have all items labeled, all words capitalized and a single spelling error. The frequency and bars are evenly spaced, but there are no marks to show where the numbers are. He could have utilized his space better by spreading the frequency out and by making his bars wider. There is too much blank white space on the graph. He draws four conclusions about his graphs, one which compares two of the responses. He gives one reason why the computer graph is better. He received a score of "proficient" on the first half of Content Standard 6.S.1.2 and a score of "proficient" on the second half. (He actually fits the advanced description on drawing conclusions, but fits the basic on comparing the graphs, so I gave him the middle score.)

Student Work Sample #4



Sample #4 – page 2


My class's favorite color is pink with 5 votes. Red and purple recieved the least votes with 1 vote each. Green is in the middle with 3 votes. Blue recieved 4 votes. The graphs represent the data equally well because they use the same data.

Looking at Student Work – Instructor notes and rating for work sample #4:

Both of his graphs have all items labeled, all words capitalized and spelled correctly. On the hand drawn graph both the frequency and bars are evenly spaced. He draws four conclusions about the graph, listing the number of votes for each color and identified the most and least common responses. He sees no difference between his two graphs because they use the same data. (I had hoped he'd notice that the dark green background on the computer graph makes it more difficult to see the bars.) He received a score of "advanced" on the first half of Content Standard 6.S.1.2 and a score of "basic" on the second half.

INSTRUCTOR NOTES

I like to do this activity early in the year as a way for students to get to know the others in their homerooms. I have them do the hand-drawn graph first so they don't just copy from the computer graph. For the writing assignment, I only had them write about their own graphs, so I could use their responses. Most of the time I have them write conclusions about their class, using all of the graphs. I also have them compare all hand-drawn graphs and computer graphs when evaluating which is more effective.

I have all students do a sloppy copy of their graph first, so they can visualize how it will fit on the paper. For students who have trouble using the space appropriately, I do help with the sloppy copy. Since I display these graphs in the halls during fall conferences, I want all students to be proud of their work. Older students would have the mathematical skills to use rulers when they figure the bar width and bar spacing.

Most students eliminated any suggested responses that had no votes before they started their graphs. When making graphs, students started with the titles and the x and y axes. They usually did the frequency before the bars. When writing their paragraphs, students often started with the responses that got the most or the fewest votes.

One common error students made on their sloppy copy was that they just started drawing the bars and making them wider or narrower depending on how much space they had left. This was the main reason I had them do a sloppy copy. Students often had difficulty comparing the two graphs because they focused more on visual appeal than on data representation.

Resources

SD Mathematics Content Standards
http://www.doe.sd.gov/contentstandards/math/index.asp

SD Assessment and Testing
http://www.doe.sd.gov/octa/assessment/index.asp

The National Assessment of Educational Progress (NAEP)
http://www.doe.sd.gov/octa/assessment/naep/index.asp

National Council of Teachers of Mathematics
http://nctm.org/

Looking at Student Work
http://www.lasw.org/index.html